Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

Originally filed 12/27/91 Office of Secretary

In the Matter of	)
	)
Amendment of Part 97 of the	)
Commission's Rules Governing the	)
Amateur Radio Services Regarding	)
Repeater and Auxiliary Operation	)
in the 1.25 Meter Band	)

RM-7869
92-289

COMMENTS UPON THE PETITION FOR RULE MAKING

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INTRODUCTION

I, THOMAS J. KIRBY respectfully submit to the commission my comments upon the petition of the American Radio Relay League, (the ARRL), for the restriction of Repeater and Auxiliary operation from a segment of the 222 to 225-MHz amateur band.

I am a licensed amateur operator holding Extra Class license and station W1EJ. I have been licensed since 1955 in the amateur service and have operated within the amateur 1.25 meter band during all of the thirty-six years since that time.

I am educated to the "Engineer" level in Electrical Engineering and hold four patents for advances in communications technology. I am a registered Professional Engineer in Massachusetts and Maine.

DISCUSSION

I wish to state here that I fully support the goal of the ARRL in its petition. That goal being to provide an opportunity for the continued growth of a richly diverse amateur technical community within the restricted bandwidth of the 1.25 Meter amateur band.

The petition requests that repeater and auxiliary operation be restricted from the 222.000 to 222.150-MHz segment of the band. The ARRL in its comments discusses the beneficial impact such a provision will have upon the "weak-signal" (experimental) activity of amateurs. I wish to support this insight.

However this aspect of the matter is but one of a number of considerations which support the allocation of a restricted sub-band on 1.25 meters. Such a sub-band should be somewhat wider than the 150-KHz suggested. A wider sub-band in order that the full range of amateur diversity be achieved. This mandated by the EMC (ElectroMagnetic Compatibility) concerns arising from the characteristics of the several diverse radio technologies today being exploited at VHF by amateurs.

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OPERABILITY CONSIDERATIONS

A number of communications technologies co-exist within each VHF amateur band, including the 1.25 Meter Band. The ARRL proposal suggests that repeater and auxiliary operations be restricted from an extremely small sub-band, 222.000 to 222.150-MHz.

Repeater and auxiliary operations are implemented such that a transmitter occupies the frequency or frequencies used 100% of the time. This whether the channel is in use for communications or not. FM modulation is used for these operations. A narrow FM deviation is used resulting in an information bandwidth of 15-KHz. To minimize interference a 20-KHz wide channel is used in the 1.25 Meter band.

The ARRL discussion reviews the needs what they call "weak-signal" communications. This is generally accepted to mean both SSB and CW communications. These are both forms of AM modulation. CW operations occupy less than 250 Hz bandwidth and SSB transmissions occupy less than 2,500 Hz of bandwidth.

The operational thresholds for these FM and AM modes differ by more than 19 db when the characteristics of radio detectors are considered.

A recent EMC analysis demonstrated that a "weak-signal" CW amateur station has a useful sensitivity of -174.6 dBm (Yes slightly below kTB on the horizon at 135 cm). This indicates that on a spherical earth the CW station is undetectable to the FM station over more than 90% of the CW stations coverage area. The CW station receives signals from the FM station over a large portion of this area. Thus a strong asymmetry in interference experience is present.

Amateur operating practice is to listen before transmitting. If the frequency is in use another frequency is chosen for use. This practice will not function in the presence of such strong asymmetries.

Reception asymmetries are present where ever a significant divergence in operational bandwidths and modes is present. A less sensitive mode destroys the utility of the more sensitive configuration. For this reason an opportunity for separation needs to be provided.

DIGITAL OPERATIONS

Digital operations are active and growing from 223.500-MHz up in frequency. Rates to 56 KiloBaud in bandwidths to 100-KHz are used. If a 150-KHz sub-band at 222.000 MHz is created then 350-KHz of bandwidth is available at 223.500 MHz with todays amateur practice. This is totally inadequate for the developing wideband (B=>20-KHz) amateur activity.

Spectrum efficient digital study is also underway. CELP operations by amateurs were reported at the recent digital conference. This activity can use transmission bandwidths consistent to those of AM operations. Efficient CELP operations should proceed within a segment of any narrowband, "weak-signal" sub-band.

PROPAGATION STUDIES

The amateur beacon bands have been reallocated on all of the amateur bands except the 1.25 Meter Band. Relocation here is even more urgent than at 144 MHz as is shown by the EMC study mentioned earlier. The amateur practice is to offset such beacon bands 300-KHz above the "weak-signal" sub-band edge. This consideration argues for a wider restricted sub-band.

SUB-BAND PROPOSAL

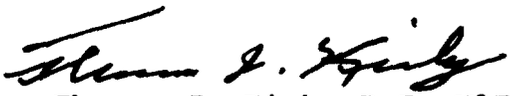
The several technical factors mentioned and others yet to be developed in detail require that a larger sub-band be adopted than that of the ARRL's proposal. I suggest that repeater and auxiliary operations be restricted from the sub-band from 222.000 to 222.320-MHz. A 320-KHz wide sub-band at 222.000 MHz will open a window from 223.500 to 223.950-MHz for wideband digital operations. Additionally FM simplex operations from 223.400 to 223.500 MHz will be protected.

A 320-KHz sub-band devoted to both "weak-signal" and other narrowband operations including advanced digital technologies will allow growth of the amateur technology base. Additionally it will permit the collection of detailed propagation data to proceed in this transitional spectral region.

SUMMARY

I support fully the ARRL petition to restrict repeater and auxiliary operation in a small sub-band at the bottom of the 222.000 to 225.000-MHz amateur band. I request that the restricted sub-band extend from 222.000 to 222.320-MHz.

Respectfully,



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